

# **2015 International Workshop on Evapotranspiration Mapping for Water Security**



**How can growers use ET information in irrigation  
management?**  
***Opportunities and Challenges***

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# OUTLINE

- Background
- Irrigation Management & Irrigation Efficiency
- Evapotranspiration (ET) in irrigation management
- Opportunities/Challenges



# About Western Growers

*fresh fruit & vegetables* **50%**



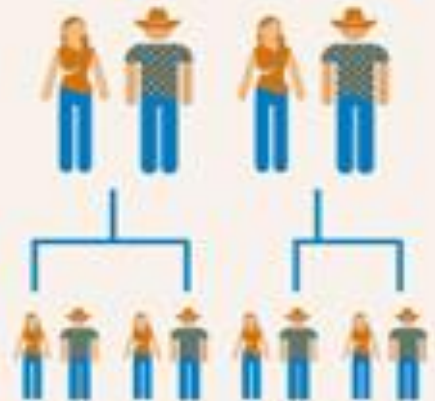
*organic fresh produce* **1/3**



*tree nuts* **99%**



*We are multi-generational*  
**FAMILY FARMERS**





# Irrigation Management

- Every irrigation system has advantages and disadvantages (surface, sprinkler and drip)
- In California, Arizona and Colorado a combination of irrigation systems is primarily used
- Irrigation management impacted by local/regional/state differences – don't assume it is straightforward



# Irrigation Efficiency

- Proper management of existing systems (in some cases replacing current systems)
- Using irrigation scheduling (when and how much to irrigate)

The screenshot shows a web browser window with the URL <https://www.avocadosource.com/tools/IrrigationCalculator.asp>. The page is titled "Irrigation Calculator" and contains a form for calculating irrigation requirements for avocado groves. The form includes sections for "Principles of Irrigation" with dropdowns for "Select a Crop" (Avocado), "Kc Source" (California New Values), and "Data Source" (SELECT SOURCE). It also has radio buttons for "English Units" and "Metric Units". The "Method" section has radio buttons for "Trees per Acre" and "Tree Spacing". The "Number of Emitters per Tree" is set to 1. The "Surface area under tree canopy (ft²)" is set to 1. The "Emitter Output (Gall/Hour)" is set to 1. The "Grove Size (acres)" is set to 1. A yellow box contains the text "All fields with yellow boxes must be filled out, while fields are optional." Below this is a "Calculate" button. The results section shows "Water per tree per day or period" as 1 gallons, "Watering time per tree per day or period" as 1 hours, "Total Water Requirements for Grove" as 1 gallons, "Allocated Water for Grove" as 1 gallons, and "Shortfall" as 1 gallons. A note states "The expanded irrigation calculator: The irrigation calculator has been expanded to provide the user more variables to consider when scheduling water usage. These include: The ability to vary the DU to examine how improving irrigation uniformity can conserve water. The ability to designate canopy coverage (i.e. young trees, tree removal or stumped trees). The ability to designate both the number of emitters per tree and their output to account for multiple emitters per tree." A "Background:" section explains that water allocation for farmers in the MWD-supplied water districts of southern CA will be cut by 30% beginning Jan 1, 2008. The page is created by Reuben Hofshi and Shari Hofshi, copyright © The Hofshi Foundation 2006-2007. All Rights Reserved. The calculator is a revision of the CRRS calculator by R. Hofshi, S. Hofshi and B. Faber ([www.avocad.org](http://www.avocad.org)).



# ET in irrigation management

- ET is one tool in the toolbox
- Producers not utilizing ET may not be aware of what it is and how to use it
- Producers utilizing ET may have more comprehensive irrigation management systems
- Real-time ET could be of greater benefit for many producers (not subject to water orders)



# ET in irrigation management



- Great reference for irrigation scheduling
- Other considerations: moisture levels, weather conditions, crop stage, soil texture, field observations and experience
- Irrigation volume determined by ET and other considerations





# Use of ET

## *Challenges*

- ET data gaps due to lack of local/ representative weather stations in certain locations
- Lack of local commodity specific irrigation scheduling calculators (Real-time crop, regional/site specific conditions should be considered when using ET)

## *Opportunities*

- ET data enhancement. For example, CIMIS \* is utilizing remotely sensed satellite data to generate ETo maps and address data gaps.
- Support/continue successful efforts that consider crop, regional/site specific conditions (irrigation calculators for avocados, lettuce, almonds, wine grapes)



\* California Irrigation Management Information System (CIMIS)





# Use of ET



## *Challenges*

- Lack of awareness and understanding of how to use ET
- ET and other irrigation support data comes from different sources (different equipment and controls)

## *Opportunities*

- Potential outreach/training efforts to increase access/use ET in irrigation management
- Integrating ET and other irrigation support data into other agricultural management tools and reporting systems (a more comprehensive platform)





# Use of ET

## *Challenges*

- Lack of technical assistance to utilize ET and other irrigation tools
- The use of ET and more sophisticated tools in irrigation management requires qualified operators

## *Opportunities*

- Technical assistance to utilize different irrigation tools including ET
- Potential outreach/training activities



# Conclusions

- Irrigation decisions are impacted by several factors, which also influence the use of ET in irrigation management
- ET is one tool in the toolbox. The better the tool, the better the outcome
- There are opportunities for outreach/research (lack of awareness, need to have a single platform to utilize ET/other support tools)

